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10/530,797	09/26/2005	Paul Buschke	100143.00005	4402

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EXAMINER	
WASHBURN, DOUGLAS N	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,797	BUSCHKE ET AL.	
	Examiner	Art Unit	
	DOUGLAS N. WASHBURN	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-13 and 15-20* is/are rejected.

7)☒ Claim(s) *14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 October 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1 Applicant's arguments with respect to claims 9 -16 have been considered but are moot in view of the new grounds of rejection.

Applicant amended claim 9 recites, in part, "the transrnit/receiver probe comprising a couplant for coupling to the entrance surface of the work piece, wherein the couplant allows for varying the angle under which the coupling to the entrance surface is performed in at least two solid angles" which finds support in the specification ¶ 0008 which recites "[0008] **Using the prior art method**, *an operator couples an ultrasonic probe* to a to-be-tested spot weld joint *and moves the probe in at least two solid angles and in absolute terms with respect to the* weld *point until good backwall echo sequence with simultaneously good entrance signal is achieved*. He moves the probe until a good enough quality of the A-scan is obtained, thus aiming at achieving a good quality A-scan."

Examiner notes applicant admits "varying the angle under which the coupling to the entrance surface is performed in at least two solid angles" to be prior art. Further, examiner notes the motivation to move a probe relative to a workpiece is to improve signal quality, in general, and signal to noise in particular.

Further applicant argues " the apparatus of the claimed invention is designed **to allow for the varying of the angle under which the coupling to the entrance surface is performed in at least two solid angles**; to accomplish this, the **probe must be moved in at least two solid angles relative to the entrance face of the work piece**. In stark contrast, the apparatus shown and described in Diaz does require or enable the optimization of the coupling angle to the work piece under inspection, as the coupling angle is always 90 degrees to the entrance face of the work piece. Therefore, Diaz does not teach, enable or otherwise suggest an ultrasonic inspection apparatus for non-destructive inspection of a work piece including a probe comprising a couplant that allows for varying the angle under which the coupling to the entrance surface is performed in at least two solid angles."

Examiner notes Diaz recites " the transducer 40 has a front end contact surface 38 comprising in part **a unique dry-coupling membrane** that is adhered to the surface, which membrane **couples the acoustic transmission** through the surface of a container without the need for acoustic gels or other coupling agents. The transducer 40 is thus designed in such a way as **to substantially eliminate the need for any contact gel** (an "acoustic gel"), which gel is **commonly used in the prior art for efficiently directing (coupling) acoustic energy into a material**." (column 12, lines 21-34) and further "**a series of readings are taken or acquired by the inspection apparatus** 10, during which time the operator is able to observe the waveform. **It may be that the waveform is somewhat weak or in some other way suspect. If so, the operator could make adjustments to the positioning of the gun to make sure there is proper alignment. Alternatively, the operator can amplify the signal to insure a better display**." (column 28, lines 42-48) which discloses an inherent capacity of Diaz to move the gun (ie change the angle of the gun relative to the surface or amplify the signal) to improve signal quality, in general, and signal to noise in particular. Further, the coupling angle therefore is **not always** 90º. Therefore applicant's arguments with respect to claims 9-16 have been considered but are moot in view of the new grounds of rejection.

Information Disclosure Statement

2 Examiner objection to information disclosure statement filed 11 October 2005 was in error the objection is withdrawn.

Claim Rejections - 35 USC § 102

3 The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 9, 10, 12, 13, 15, 16 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Diaz et al. (US 6,938,488) (Hereafter referred to as Diaz).

Diaz teaches:

Regarding claim 9, an ultrasonic inspection apparatus (inspection apparatus; column 3, line 2) for non-destructive inspection (column 1, line 67) of a work piece (container; column 2, line 26), the work piece having an entrance surface (front wall; column 2, lines 28 and 29) and a back wall (back wall; column 2, line 29);

Regarding claim 9, a transmit/receive probe (transducer; column 10, line 43; figure 1, element 40), the transmit/receiver probe comprising a couplant (rubber layer; column 12, line 39; figure 3, element 42) for coupling to the entrance surface of the work piece (column 13, lines 41-45) wherein the couplant allows for varying the angle under which the coupling to the entrance surface is performed in at least two solid angles (**It may be that the waveform is somewhat weak or in some other way suspect. If so, the operator could make adjustments to the positioning of the gun to make sure there is proper alignment. Alternatively, the operator can amplify the signal to insure a better display;** column 28, lines 42-48);

Regarding claim 9, a transmitter (transducer; column 10, line 43; figure 1, element 40) connected to the transmit/receive probe, the transmitter generating transmit pulses (The ultrasonic pulse emitted from the front surface 38 of the transducer 40 in the gun assembly 12 travels through the material in the container being inspected; column 10, lines 51-53) which it then delivers to the probe, wherein the transmit pulses, on the one side, are reflected at the entrance surface of the work piece back to the probe with an entrance echo pulse resulting there from and, on the other side, penetrate the work piece where they are reflected at least once at the back wall of the work piece with a back wall echo pulse resulting there from (When the ultrasonic pulse reaches the far wall of the container, it is reflected back as an acoustic echo to the transmission location. The acoustic echo reaches the transducer 40, which receives this acoustic echo and translates the acoustic echo into an analog electrical signal; column 10, lines 53-58);

Regarding claim 9, a receiver (transducer; column 10, line 43; figure 1, element 40) connected to the probe, the receiver being suited for receiving the entrance echo pulse and the at least one back wall echo pulse and converting the received echo pulses to electric echo signals (When the ultrasonic pulse reaches the far wall of the container, it is reflected back as an acoustic echo to the transmission location. The acoustic echo reaches the transducer 40, which receives this acoustic echo and translates the acoustic echo into an analog electrical signal; column 10, lines 53-58);

Regarding claim 9, a monitor that is connected to the receiver for displaying the electric echo signals received from the receiver (the transducer 40, which receives this acoustic echo and translates the acoustic echo into an analog electrical signal. The analog signal is then sent into the circuit board section 20 for further processing to translate the analog signal into a digital signal. The digital signal is then transmitted from the circuit board section 20 to the computer (e.g., PDA, laptop, desktop, or other computer) 14; column 10, lines 56-63; the display panel of the PDA 14; column 15, line 11);

Regarding claim 9, the ultrasonic inspection apparatus has a bar display (typical waveform displayed on the graphic display (i.e., interface) of the computer 14. This waveform presented on the display is derived from the analog signal received from the transducer 40, which is translated into a digital signal by the digital board 1000, which in turn is received by, and is then presented as a waveform on the display screen of the host computer 14; column 27, lines 7-14), the bar display being suited for showing at least one signal value in real time (column 2, lines 53 and 54), with the signal value being derived from one of the following: the entrance echo, one back wall echo, a plurality of back wall echoes (the transducer 40 is pressed against the near wall of the container, and by sending an acoustic pulse from the transducer so that the ultrasonic pulse travels through the container to the far wall so that an acoustic echo travels back to the transducer 40. Often, a second echo will be generated when the echo traveling back to the near wall is reflected back again to the far wall which in turn results in the second acoustic echo traveling back to the transducer 40; column 26, lines 65 et seq; column 27, lines 1-3);

Regarding claim 10, the work piece under inspection further comprises flaws (defect; column 1, line 51), the transmit pulses penetrating the work piece are also reflected at the flaws with flaw echoes resulting there from, and the bar display being suited for showing a signal value of a signal being derived from one of the following: the flaw echo of one selected flaw or the flaw echoes of a plurality of flaws (due to the fact that there is a differing material interface at the surface of the foreign object (acoustic impedance mismatch), there is an echo resulting from the ultrasonic pulse contacting that interface; column 27, lines column 27, lines 53-56);

Regarding claim 12, the bar display is disposed proximate to the monitor (figures 12, 13, 19a, 19b, 19c);

Regarding claim 13, a monitor that is connected to the receiver for displaying the electric echo signals received from the receiver (waveform presented on the display is derived from the analog signal received from the transducer 40, which is translated into a digital signal by the digital board 1000, which in turn is received by, and is then presented as a waveform on the display screen; column 27, lines 9-14);

Regarding claim 15, the monitor has a time axis and the bar display is disposed so as to extend transversely with respect to the time axis of the monitor (figures 12, 13, 19a, 19b, 19c);

Regarding claim 16, the monitor has a transverse dimension and the bar display has a length that equals the transverse dimension of the monitor (figures 12, 13, 19a, 19b, 19c);

Regarding claim 20, non-destructive inspection of a work piece (an ultrasonic apparatus suited for non-destructive/non-invasive inspection, interrogation, and investigation of a wide variety and types of containers (both sealed and unsealed) as well as materials within the container; column 1, line 66 et seq.; column 2, lines 1-3), the work piece defining an entrance surface and a back wall (simple containers may comprise at least a front wall and a back wall in order to define in part the receptacle or containing vessel or chamber within a container or otherwise bulk material; column 2, lines 27-31), the method comprising the steps of: generating transmit pulses by means of a probe (ultrasonic pulse emitted from the front surface 38 of the transducer 40; column 10, lines 51 and 52);

Regarding claim 20, delivering the transmit pulses to the entrance surface of the work piece (The ultrasonic pulse emitted from the front surface 38 of the transducer 40 in the gun assembly 12 travels through the material in the container being Inspected; column 10, lines 51-53), wherein the transmit pulses, on one side, are reflected at the entrance surface of the work piece back to the probe with an entrance echo pulse resulting therefrom (The reflection pulse (or wave) is first transmitted from the transducer 40 with which the transducer 40 is in contact to the near wall and immediately back to the transducer 40; column 27, lines 17-20) and, on an opposite side, penetrate the work piece where they are reflected at least once at the back wall of the work piece with a back wall echo pulse resulting therefrom (When the ultrasonic pulse reaches the far wall of the container, it is reflected back as an acoustic echo to the transmission location; column 10, lines 54-56);

Regarding claim 20, receiving the entrance echo pulse and the at least one back wall echo pulse from a receiver (The reflection pulse (or wave) is first transmitted from the transducer 40 with which the transducer 40 is in contact to the near wall and immediately back to the transducer 40. The pulse coming back from the near wall of the container comprises a series of oscillations, which in FIG. 12 is indicated as the "transducer ring-down" portion of the waveform. Immediately to the right of the ring-down zone, the waveform comprises low amplitude oscillations, which are due mainly to background noise and/or continued oscillations caused by the receipt of the initial waveform; column 27, lines 17-27; figure 12) and converting the received echo pulses to electric echo signals (The circuit section is arranged to generate electric pulse(s) for the sensing section, receive the analog signal(s) from the sensing section and to convert the analog signal(s) to digital signal(s) representative of the waveform(s) of the reflected ultrasonic pulse(s); column 3, lines 12-16);

Regarding claim 20, displaying the electric echo signals received from the receiver on a monitor (a typical waveform displayed on the graphic display (i.e., interface) of the computer 14. This waveform presented on the display is derived from the analog signal received from the transducer 40, which is translated into a digital signal by the digital board 1000, which in turn is received by, and is then presented as a waveform on the display screen; column 27, lines 7-13);

Regarding claim 20, showing at least one signal value in real time (an inspection apparatus for on-line, real-time monitoring, interrogation and investigation of internal contents in containers; column 2, lines 53-55) on a bar display (typical waveform displayed on the graphic display (i.e., interface) of the computer 14. This waveform presented on the display is derived from the analog signal received from the transducer 40, which is translated into a digital signal by the digital board 1000, which in turn is received by, and is then presented as a waveform on the display screen of the host computer 14; column 27, lines 7-14), with the signal value being derived from one of (i) the entrance echo, (ii) one back wall echo, or (iii) a plurality of back wall echoes (**one or more return acoustic echoes** are received by the transducer 40 and are translated into an analog signal(s); column 17, lines 26 and 27);

And regarding claim 20, optimizing the coupling of the transmit pulses to the work piece by moving the probe in at least two solid angles and in absolute terms with respect to the work piece (It may be that the waveform is somewhat weak or in some other way suspect. If so, the operator could make adjustments to the positioning of the gun to make sure there is proper alignment. Alternatively, the operator can amplify the signal to insure a better display; column 28, lines 45-48).

Claim Rejections - 35 USC § 103

4 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Diaz in view of Horn (US 4,275,596) (Hereafter referred to as Horn).

Diaz teaches:

Regarding claim 9, an ultrasonic inspection apparatus (inspection apparatus; column 3, line 2) for non-destructive inspection (column 1, line 67) of a work piece (container; column 2, line 26), the work piece having an entrance surface (front wall; column 2, lines 28 and 29) and a back wall (back wall; column 2, line 29);

Regarding claim 9, a transmit/receive probe (transducer; column 10, line 43; figure 1, element 40), the transmit/receiver probe comprising a couplant (rubber layer; column 12, line 39; figure 3, element 42) for coupling to the entrance surface of the work piece (column 13, lines 41-45) wherein the couplant allows for varying the angle under which the coupling to the entrance surface is performed in at least two solid angles (**It may be that the waveform is somewhat weak or in some other way suspect. If so, the operator could make adjustments to the positioning of the gun to make sure there is proper alignment. Alternatively, the operator can amplify the signal to insure a better display;** column 28, lines 42-48);

Regarding claim 9, a transmitter (transducer; column 10, line 43; figure 1, element 40) connected to the transmit/receive probe, the transmitter generating transmit pulses (The ultrasonic pulse emitted from the front surface 38 of the transducer 40 in the gun assembly 12 travels through the material in the container being inspected; column 10, lines 51-53) which it then delivers to the probe, wherein the transmit pulses, on the one side, are reflected at the entrance surface of the work piece back to the probe with an entrance echo pulse resulting there from and, on the other side, penetrate the work piece where they are reflected at least once at the back wall of the work piece with a back wall echo pulse resulting there from (When the ultrasonic pulse reaches the far wall of the container, it is reflected back as an acoustic echo to the transmission location. The acoustic echo reaches the transducer 40, which receives this acoustic echo and translates the acoustic echo into an analog electrical signal; column 10, lines 53-58);

Regarding claim 9, a receiver (transducer; column 10, line 43; figure 1, element 40) connected to the probe, the receiver being suited for receiving the entrance echo pulse and the at least one back wall echo pulse and converting the received echo pulses to electric echo signals (When the ultrasonic pulse reaches the far wall of the container, it is reflected back as an acoustic echo to the transmission location. The acoustic echo reaches the transducer 40, which receives this acoustic echo and translates the acoustic echo into an analog electrical signal; column 10, lines 53-58);

Regarding claim 9, a monitor that is connected to the receiver for displaying the electric echo signals received from the receiver (the transducer 40, which receives this acoustic echo and translates the acoustic echo into an analog electrical signal. The analog signal is then sent into the circuit board section 20 for further processing to translate the analog signal into a digital signal. The digital signal is then transmitted from the circuit board section 20 to the computer (e.g., PDA, laptop, desktop, or other computer) 14; column 10, lines 56-63; the display panel of the PDA 14; column 15, line 11);

And regarding claim 9, the ultrasonic inspection apparatus has a bar display (typical waveform displayed on the graphic display (i.e., interface) of the computer 14. This waveform presented on the display is derived from the analog signal received from the transducer 40, which is translated into a digital signal by the digital board 1000, which in turn is received by, and is then presented as a waveform on the display screen of the host computer 14; column 27, lines 7-14), the bar display being suited for showing at least one signal value in real time (column 2, lines 53 and 54), with the signal value being derived from one of the following: the entrance echo, one back wall echo, a plurality of back wall echoes (the transducer 40 is pressed against the near wall of the container, and by sending an acoustic pulse from the transducer so that the ultrasonic pulse travels through the container to the far wall so that an acoustic echo travels back to the transducer 40. Often, a second echo will be generated when the echo traveling back to the near wall is reflected back again to the far wall which in turn results in the second acoustic echo traveling back to the transducer 40; column 26, lines 65 et seq; column 27, lines 1-3).

Diaz fails to fully teach:

Regarding claim 11, the bar display permitting to display in multiple colors, and at least two signal values), wherein the two signal values are displayed one above the other in different colors;

And regarding claim 19, the monitor has a stripe-shaped area and the stripe-shaped area of the monitor is used as the bar display.

Horn teaches:

Regarding claim 11, the bar display permitting to display in multiple colors (FIG. 1 shows a bichromatic screen 10; column 3, lines 15 and 16), and at least two signal values (sonic control circuit 26 generates ultrasonic echo data signals indicative of the condition of volume 18 at the location indicated by the X and Y outputs; column 5, lines 4-7), wherein the two signal values are displayed one above the other in different colors (**In the illustrated embodiment, directions X and Y are perpendicular, and each corresponds to a major axis of the rectangular screen. It should be recognized, however, that directions X and Y may have any relation as long as they are not parallel, that neither direction needs to correspond to a principal axis of the screen, and that the screen can have any convenient shape**. It should also be noted that although the varying intensity of **color A** is represented by bars 12 of color A lying perpendicular to the X direction and being disposed with a linear density in the X direction that varies from one end of the screen to the other, the varying intensity of **color B** being similarly indicated, in actual practice the manner of obtaining the required variable densities is not critical. **The particular colors used are also not critical. Black, while technically not a color, can also be used**; column 3, lines 31-47);

And regarding claim 19, the monitor has a stripe-shaped area and the stripe-shaped area of the monitor is used as the bar display (**In the illustrated embodiment, directions X and Y are perpendicular, and each corresponds to a major axis of the rectangular screen. It should be recognized, however, that directions X and Y may have any relation as long as they are not parallel, that neither direction needs to correspond to a principal axis of the screen, and that the screen can have any convenient shape**; column 3, lines 31-37; figure 1, element 10).

Regarding claims 11 and 19, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Diaz of a display with the teaching of Horn of a display permitting multiple colors because combination of respective values of intensities of two colors would have been unique for each point of a screen, measurement of the intensities which would have permitted exact determination of a location of an object (Horn, column 2, lines 34-38).

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Diaz in view of Battenber et al. (US 6,247,353) (Hereafter referred to as Battenberg).

Diaz teaches:

Regarding claim 9, an ultrasonic inspection apparatus (inspection apparatus; column 3, line 2) for non-destructive inspection (column 1, line 67) of a work piece (container; column 2, line 26), the work piece having an entrance surface (front wall; column 2, lines 28 and 29) and a back wall (back wall; column 2, line 29);

Regarding claim 9, a transmit/receive probe (transducer; column 10, line 43; figure 1, element 40), the transmit/receiver probe comprising a couplant (rubber layer; column 12, line 39; figure 3, element 42) for coupling to the entrance surface of the work piece (column 13, lines 41-45) wherein the couplant allows for varying the angle under which the coupling to the entrance surface is performed in at least two solid angles (**It may be that the waveform is somewhat weak or in some other way suspect. If so, the operator could make adjustments to the positioning of the gun to make sure there is proper alignment. Alternatively, the operator can amplify the signal to insure a better display;** column 28, lines 42-48);

Regarding claim 9, a transmitter (transducer; column 10, line 43; figure 1, element 40) connected to the transmit/receive probe, the transmitter generating transmit pulses (The ultrasonic pulse emitted from the front surface 38 of the transducer 40 in the gun assembly 12 travels through the material in the container being inspected; column 10, lines 51-53) which it then delivers to the probe, wherein the transmit pulses, on the one side, are reflected at the entrance surface of the work piece back to the probe with an entrance echo pulse resulting there from and, on the other side, penetrate the work piece where they are reflected at least once at the back wall of the work piece with a back wall echo pulse resulting there from (When the ultrasonic pulse reaches the far wall of the container, it is reflected back as an acoustic echo to the transmission location. The acoustic echo reaches the transducer 40, which receives this acoustic echo and translates the acoustic echo into an analog electrical signal; column 10, lines 53-58);

Regarding claim 9, a receiver (transducer; column 10, line 43; figure 1, element 40) connected to the probe, the receiver being suited for receiving the entrance echo pulse and the at least one back wall echo pulse and converting the received echo pulses to electric echo signals (When the ultrasonic pulse reaches the far wall of the container, it is reflected back as an acoustic echo to the transmission location. The acoustic echo reaches the transducer 40, which receives this acoustic echo and translates the acoustic echo into an analog electrical signal; column 10, lines 53-58);

Regarding claim 9, a monitor that is connected to the receiver for displaying the electric echo signals received from the receiver (the transducer 40, which receives this acoustic echo and translates the acoustic echo into an analog electrical signal. The analog signal is then sent into the circuit board section 20 for further processing to translate the analog signal into a digital signal. The digital signal is then transmitted from the circuit board section 20 to the computer (e.g., PDA, laptop, desktop, or other computer) 14; column 10, lines 56-63; the display panel of the PDA 14; column 15, line 11);

And regarding claim 9, the ultrasonic inspection apparatus has a bar display (typical waveform displayed on the graphic display (i.e., interface) of the computer 14. This waveform presented on the display is derived from the analog signal received from the transducer 40, which is translated into a digital signal by the digital board 1000, which in turn is received by, and is then presented as a waveform on the display screen of the host computer 14; column 27, lines 7-14), the bar display being suited for showing at least one signal value in real time (column 2, lines 53 and 54), with the signal value being derived from one of the following: the entrance echo, one back wall echo, a plurality of back wall echoes (the transducer 40 is pressed against the near wall of the container, and by sending an acoustic pulse from the transducer so that the ultrasonic pulse travels through the container to the far wall so that an acoustic echo travels back to the transducer 40. Often, a second echo will be generated when the echo traveling back to the near wall is reflected back again to the far wall which in turn results in the second acoustic echo traveling back to the transducer 40; column 26, lines 65 et seq; column 27, lines 1-3).

Diaz fails to fully teach, regarding claim 17, the bar display is realized by a color LCD array.

Battenberg teaches:

Regarding claim 17, the bar display is realized by a color LCD array (Time and frequency domain waveform analysis are performed on the ultrasonic electrical signals. Alarm means indicate when the ultrasonic electrical signal exceeds a user selected threshold value. Display means display properties of the ultrasonic electrical signals and the electrical temperature signals. In an especially preferred embodiment, the display means is a liquid crystal display; column 5, lines 36-42).

Regarding claim 17, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Diaz of a display with the teaching of Battenberg of a liquid crystal display because a liquid crystal display would have displayed received signals in an easily readable format (Battenberg column 3, lines 33-37).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Diaz in view of Cram et al. (US 3,115,770) (Hereafter referred to as Cram).

Diaz teaches:

Regarding claim 9, an ultrasonic inspection apparatus (inspection apparatus; column 3, line 2) for non-destructive inspection (column 1, line 67) of a work piece (container; column 2, line 26), the work piece having an entrance surface (front wall; column 2, lines 28 and 29) and a back wall (back wall; column 2, line 29);

Regarding claim 9, a transmit/receive probe (transducer; column 10, line 43; figure 1, element 40), the transmit/receiver probe comprising a couplant (rubber layer; column 12, line 39; figure 3, element 42) for coupling to the entrance surface of the work piece (column 13, lines 41-45) wherein the couplant allows for varying the angle under which the coupling to the entrance surface is performed in at least two solid angles (**It may be that the waveform is somewhat weak or in some other way suspect. If so, the operator could make adjustments to the positioning of the gun to make sure there is proper alignment. Alternatively, the operator can amplify the signal to insure a better display;** column 28, lines 42-48);

Regarding claim 9, a transmitter (transducer; column 10, line 43; figure 1, element 40) connected to the transmit/receive probe, the transmitter generating transmit pulses (The ultrasonic pulse emitted from the front surface 38 of the transducer 40 in the gun assembly 12 travels through the material in the container being inspected; column 10, lines 51-53) which it then delivers to the probe, wherein the transmit pulses, on the one side, are reflected at the entrance surface of the work piece back to the probe with an entrance echo pulse resulting there from and, on the other side, penetrate the work piece where they are reflected at least once at the back wall of the work piece with a back wall echo pulse resulting there from (When the ultrasonic pulse reaches the far wall of the container, it is reflected back as an acoustic echo to the transmission location. The acoustic echo reaches the transducer 40, which receives this acoustic echo and translates the acoustic echo into an analog electrical signal; column 10, lines 53-58);

Regarding claim 9, a receiver (transducer; column 10, line 43; figure 1, element 40) connected to the probe, the receiver being suited for receiving the entrance echo pulse and the at least one back wall echo pulse and converting the received echo pulses to electric echo signals (When the ultrasonic pulse reaches the far wall of the container, it is reflected back as an acoustic echo to the transmission location. The acoustic echo reaches the transducer 40, which receives this acoustic echo and translates the acoustic echo into an analog electrical signal; column 10, lines 53-58);

Regarding claim 9, a monitor that is connected to the receiver for displaying the electric echo signals received from the receiver (the transducer 40, which receives this acoustic echo and translates the acoustic echo into an analog electrical signal. The analog signal is then sent into the circuit board section 20 for further processing to translate the analog signal into a digital signal. The digital signal is then transmitted from the circuit board section 20 to the computer (e.g., PDA, laptop, desktop, or other computer) 14; column 10, lines 56-63; the display panel of the PDA 14; column 15, line 11);

And regarding claim 9, the ultrasonic inspection apparatus has a bar display (typical waveform displayed on the graphic display (i.e., interface) of the computer 14. This waveform presented on the display is derived from the analog signal received from the transducer 40, which is translated into a digital signal by the digital board 1000, which in turn is received by, and is then presented as a waveform on the display screen of the host computer 14; column 27, lines 7-14), the bar display being suited for showing at least one signal value in real time (column 2, lines 53 and 54), with the signal value being derived from one of the following: the entrance echo, one back wall echo, a plurality of back wall echoes (the transducer 40 is pressed against the near wall of the container, and by sending an acoustic pulse from the transducer so that the ultrasonic pulse travels through the container to the far wall so that an acoustic echo travels back to the transducer 40. Often, a second echo will be generated when the echo traveling back to the near wall is reflected back again to the far wall which in turn results in the second acoustic echo traveling back to the transducer 40; column 26, lines 65 et seq; column 27, lines 1-3).

Diaz fails to fully teach, regarding claim 18, the work piece under inspection is composed of at least two sheet metal plates that are joined together by a spot weld joint, and the quality of the spot weld joint is to be determined.

Cram teaches:

Regarding claim 18, the work piece under inspection is composed of at least two sheet metal plates that are joined together by a spot weld joint, and the quality of the spot weld joint is to be determined (testing techniques generally and more specifically to a non-destructive method for evaluating the characteristics of **spot welds** in sheet metal components. The conventional spot weld is made by assembling together **two pieces of sheet metal**, pressing opposite electrodes into firm contact with opposite sheets and then passing a heavy electrical current through the electrodes and sheet metal while continuing the, pressure; column 1, lines 9-16).

Regarding claim 18, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Diaz of non-intrusive/non-invasive examination, inspection and/or investigation of a container with the teaching of Cram of spot welded sheet metal components because inspection of a container would have permitted detecting defects in materials (Diaz column 1, line 51).

Allowable Subject Matter

5 Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

Claim 14 recites, in part, "the stripe-shaped area of the monitor is a border area of the monitor". This feature **in combination with the remaining claimed structure** avoids the prior art of record.

It is these limitations, which are not found, taught or suggested in the prior art of record, and are recited in the claimed combination that makes these claims allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas N. Washburn whose telephone number is (571) 272-2284. The examiner can normally be reached on Monday through Thursday 6:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DNW

/John E Barlow Jr./
Supervisory Patent Examiner, Art Unit 2863